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AUTHOR(S):

Tsubamoto, Takehisa; Zin-Maung-Maung-Thein; Thaung-Htike; Egi, Naoko; Chit-Sein,; Maung-Maung,; Takai, Masanaru

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Discovery of chalicothere and *Dorcabune* from the upper part (lower Pleistocene) of the Irrawaddy Formation, Myanmar

Takehisa Tsubamoto¹, Zin-Maung-Maung-Thein², Thaung-Htike², Naoko Egi²,
Chit-Sein³, Maung-Maung⁴, and Masanaru Takai²

¹*Center for Paleobiological Research, Hayashibara Biochemical Laboratories, Inc.,
Shimoishii, Okayama 700-0907, Japan*

²*Primate Research Institute, Kyoto University, Inuyama, Aichi 484-8506, Japan*

³*Department of Geology, University of Yangon, Yangon, Myanmar*

⁴*Department of Geology, University of Mandalay, Mandalay, Myanmar*

Abstract

We describe fossil dental specimens of a chalicothere (Perissodactyla, Mammalia) and *Dorcabune* (Tragulidae, Artiodactyla, Mammalia) discovered from the upper part (lower Pleistocene) of the Irrawaddy Formation at Gwebin area, central Myanmar. The specimens described here consist of three molar fossils: a left upper molar and a left M₁ or M₂ of a chalicothere (cf. *Nestoritherium* sp.); and a right M₃ of *Dorcabune* sp. Although fragmentally, this is the first discovery of the Chalicotheriidae and *Dorcabune* from the upper part of the Irrawaddy Formation.

Introduction

The upper Miocene to lower Pleistocene Irrawaddy Formation (= Irrawaddy Group = Irrawaddy Series = Fossil Wood Group) is widely distributed in central Myanmar (Theobald, 1869; Noetling, 1895; Stamp, 1922; Bender, 1983), yielding many mammalian fossils (Colbert, 1938, 1943; Moe Nyunt, 1987). We, the Kyoto University field parties with Myanmar researchers, carried out a fossil expedition at the Gwebin area of central Myanmar, where the upper part of the Irrawaddy Formation is exposed (Bender, 1983; Moe Nyunt, 1987) during the field season of 2002 November. At the Gwebin area, we found fossil dental remains of the Chalicotheriidae (Perissodactyla, Mammalia) and *Dorcabune* (Tragulidae, Artiodactyla, Mammalia).

In this short article, we describe these fossils. Although fragmentally, this is the first discovery of the Chalicotheriidae and *Dorcabune* from the upper part of the Irrawaddy Formation (Colbert, 1938, 1943; Moe Nyunt, 1987).

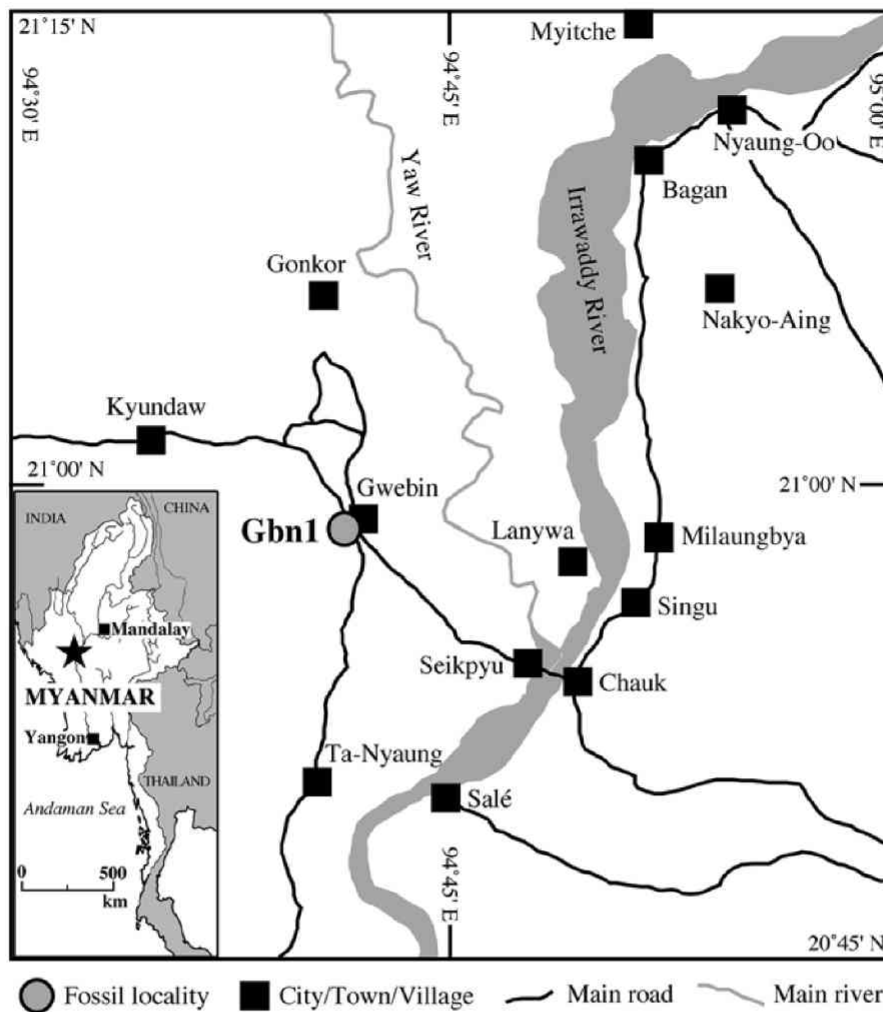


Figure 1. Map of the central part of Myanmar, showing the fossil locality (Gbn1) of the upper part of the Irrawaddy Formation.

Abbreviations

NMMP-KU-IR, National Museum - Myanmar - Paleontology - Kyoto University - Irrawaddy (stored in the National Museum, Yangon, Myanmar, and in the Department of Geology, University of Yangon, Yangon, Myanmar).

Fossil locality

The Gbn1 locality (an approximate GPS = 20°58'31"N; 94°41'27"E), which is located at the west side of the main road of Gwebin village, Seikpyu Township, Magway Division, central Myanmar (Figure 1).

Stratigraphic position

The upper part of the Irrawaddy Formation, geologically located in the Central Irrawaddy Lowland (Ba Than Haq, 1981; Bender, 1983). The upper part of the Irrawaddy

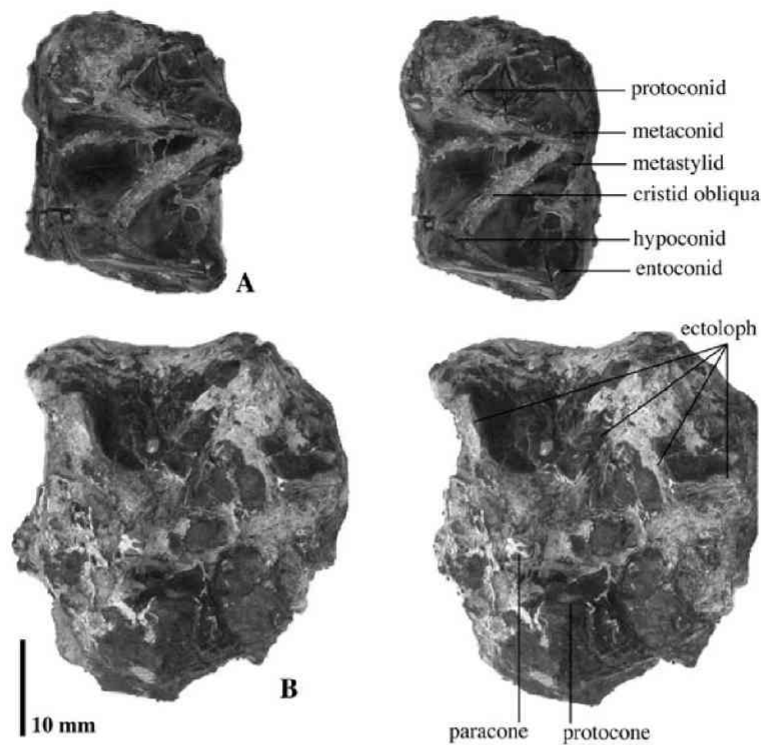


Figure 2. Cf. *Nestoritherium* sp. **A:** NMMP-KU-IR 0051, a fragmentary left $M_{1 \text{ or } 2}$, occlusal view (stereo pair). **B:** NMMP-KU-IR 0053, a fragmentary left upper molar, occlusal view (stereo pair).

Formation at Gwebin area consists mainly of fluvial deposits, yielding many mammalian fossils such as bovids, suids, hippos, anthracotheres, rhinos, and elephants (Moe Nyunt, 1987).

Geologic age

Early Pleistocene, according to the mammalian fauna of the upper part of the Irrawaddy Formation at Gwebin area (Colbert, 1943; Moe Nyunt, 1987).

Systematic paleontology

Order Perissodactyla Owen, 1848

Family Chalicotheriidae Gill, 1872

Subfamily Chalicotheriinae Gill, 1872

Genus cf. *Nestoritherium* Kaup, 1859

Cf. *Nestoritherium* sp.

Figure 2

Material.—NMMP-KU-IR 0051, a fragmentary left $M_{1 \text{ or } 2}$; NMMP-KU-IR 0053, a fragmentary left upper molar.

Dental measurements.— M_1 or M_2 (NMMP-KU-IR 0051): length (estimate) = 30.8 mm; trigonid width = 20.8 mm; talonid width (estimate) = 20.2 mm.

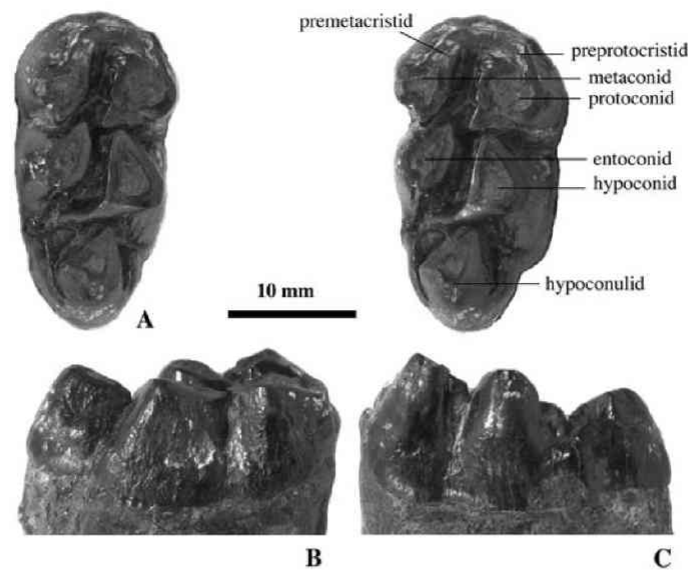


Figure 3. *Dorcabune* sp. (NMMP-KU-IR 0055, a right M_3). **A:** occlusal view (stereo pair). **B:** buccal view. **C:** lingual view.

Description and comments.—NMMP-KU-IR 0051 (Figure 2A) is referable to a fragmentary left lower molar of a chalicothere in having brachyodont crown, a metastylid, a cristid obliqua linking to the metastylid, and no hypoconulid. NMMP-KU-IR 0053 (Figure 2B) is referable to a fragmentary left upper molar of a chalicothere in having W-shaped ectoloph and in being relatively large. These materials are provisionally referred to *Nestoritherium* because the present materials are very poor and because *Nestoritherium* is the only recorded Pleistocene chalicotheriid in Asia. This is the first discovery of the Chalicotheriidae in the upper part of the Irrawaddy Formation, although a possible chalicotheriid femur have been found in the lower part of the Irrawaddy Formation (Noetling, 1897a, b; Hooijer, 1951).

Order Artiodactyla Owen, 1848
Suborder Ruminantia Scopoli, 1777
Family Tragulidae Milne-Edwards, 1864
Genus *Dorcabune* Pilgrim, 1910

Dorcabune sp.

Figure 3

Material.—NMMP-KU-IR 0055, a right M_3 .

Dental measurements.— M_3 (NMMP-KU-IR 0055): length = 25.4 mm; trigonid width = 12.6 mm; talonid width = 11.9 mm.

Description and comments.—NMMP-KU-IR 0055 shows a typical morphology of tragulid M_3 with *Dorcatherium*-fold (= “sigma structure” in Qiu and Gu, 1991; = “M

structure" in Mottl, 1954, 1961) and enlarged hypoconulid. The present M_3 is low-crowned, rather bunodont than selenodont among the tragulids, and moderately worn. The metaconid is mesiodistally located nearly at the same position as the protoconid. The preprotocristid and premetacristid do not protrude mesially very much; and they are connected to one another, forming mesially closed trigonid basin. The entoconid is mesial to hypoconid. There seems to be no hypoconulid loop. There is no cristid linking the entoconid to the hypoconulid. Cingula are present at the mesial margin of the crown and at the lingual base of the hypoconulid. There are accessory cusps between the lingual base of the protoconid and hypoconid and between the lingual base of the hypoconid and hypoconulid. The dental size (M_3 length = 25.4 mm) is rather similar to that of larger *Dorcabune* and *Dorcatherium* species rather than to that of smaller species (Colbert, 1935).

The present M_3 is referable to *Dorcabune* rather than to *Dorcatherium* because: (1) the cusps of the present M_3 seem to be more bunodont than those in *Dorcatherium*; (2) the preprotocristid and premetacristid of the present M_3 are not so mesially protrudent as those in *Dorcatherium*; and (3) the present M_3 has distinct lingual and buccal cingulids on the hypoconulid region (Pilgrim, 1915: pls. 21-23; Colbert, 1935: p. 303, fig. 137, p. 308, fig. 140, p. 310, fig. 142, p. 312, fig. 144; Qiu and Gu, 1991). This is the first discovery of *Dorcabune* in Myanmar and is the first discovery of the Tragulidae from the Irrawaddy Formation.

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